

SELECTING OF BRANDS MOBILE PHONE USING ANALYTIC HIERARCHY
PROCESS (AHP) METHOD: A CASE OF UNIVERSITI MALAYSIA PAHANG
(UMP)

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ABSTRACT

The aim of this research is to study about selecting of brands mobile phone using analytic hierarchy process (AHP) method among Faculty of Industrial Management (FIM) students. For the functionality, physical characteristics, technical features, basic requirement and customer excitement are set as the criteria. Then, the Apple/I-phone brand, Sony brand, Nokia brand and also Samsung brand is the alternative in this research. One hundred and sixty-nine of degree students in Faculty of Industrial Management (FIM) were surveyed by questionnaire. The collected data was analyzed by using Microsoft Excel and also Microsoft Silverlight software. Results show that the functionality is become the best criteria and the Samsung brand is become the top ranking as an alternative in this research.

ABSTRAK

Tujuan kajian ini ialah untuk mengkaji tentang pemilihan jenama telefon mudah alih dengan menggunakan kaedah proses analisis hierarki (AHP) di kalangan pelajar Fakulti Pengurusan Industri (FIM). Untuk fungsi, ciri-ciri fizikal, ciri-ciri teknikal, keperluan asas dan kegembaraan pelanggan ditetapkan sebagai kriteria. Kemudian, jenama Apple / I-phone, jenama Sony, jenama Nokia dan juga jenama Samsung adalah alternatif dalam kajian ini. Satu ratus enam puluh sembilan daripada pelajar ijazah di Fakulti Pengurusan Industri (FIM) telah dikaji oleh soal selidik. Data yang diperolehi dianalisis dengan menggunakan Microsoft Excel dan juga perisian Microsoft Silverlight. Keputusan menunjukkan bahawa fungsi merupakan kriteria yang terbaik dan jenama Samsung merupakan ranking teratas sebagai alternatif dalam kajian ini.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

The cellular telephone also known as mobile phone or cell phone or hand phone is a long-range, portable electronic device used for mobile communication. The mobile phone also can make and receive telephone call over the radio link while moving the around geographic area. The mobile phone also can be defined as a type of short-wave analog or digital communication which a subscriber has a wireless connection from the mobile phone to relatively nearby transmitter.

In addition, the modern mobile phones also can support a wide variety of other services such as text messaging, MMS, email, internet access, infrared, Bluetooth, mobile application, gaming and also photography. In this case, mobile phones that offer these and more general computing capabilities are referred to as smartphones.

Besides that, in terms of branding, the brand is an idea or image to the specific product or services to attract, connect and also retain the consumers to identify the name, logo, slogan, or design of the company who owns the idea or image.

Branding is when that idea or image is marketed so that it is recognizable by more and more people, and identified with a certain service or product when there are many other companies offering the same service or product.

Branding permits customers to develop association with the brand and eases the purchase decision. A brand will drive sales, build customer loyalty, create brand value, and most of all, it will be the catalyst for business growth.

Last but not least, the analytical hierarchy process (AHP) is a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Thomas L. Saaty in the 1970s and has been extensively studied and refined since then. In general, AHP comprising by the three main principles which is hierarchy framework, priority analysis and consistency verification.

1.1 PROBLEM STATEMENT

Studies have shown the majority of high school students own and use cell phones in a variety of brands. The strong brand can get the best effects on consumer perception and preferred. Although there are many researches on consumer preference in decision making process, however some students still don't know how to choose the brands of mobile phone based on different criteria using Analytical Hierarchy Process (AHP) method. Besides that, the aim of this research also is to understand the preferences on brand mobile phone among the Faculty of Industrial Management (FIM) students.

1.2 RESEARCH OBJECTIVE

1. To determine the brands of mobile phone that becomes most preferred among the Faculty of Industrial Management (FIM) student.
2. To rank criteria's mobile phone selected among Faculty of Industrial Management (FIM) student.

1.3 RESEARCH QUESTIONS (RQ)

Based on the research objectives above, research questions are formulated as follows:

RQ1: what are the brands of the mobile phone that Faculty of Industrial Management (FIM) student preferred to purchase?

RQ2: what are the topmost criteria ranking for the brand mobile phones selected among Faculty of Industrial Management (FIM) students?

1.4 THE HIERARCHICAL FRAMEWORK

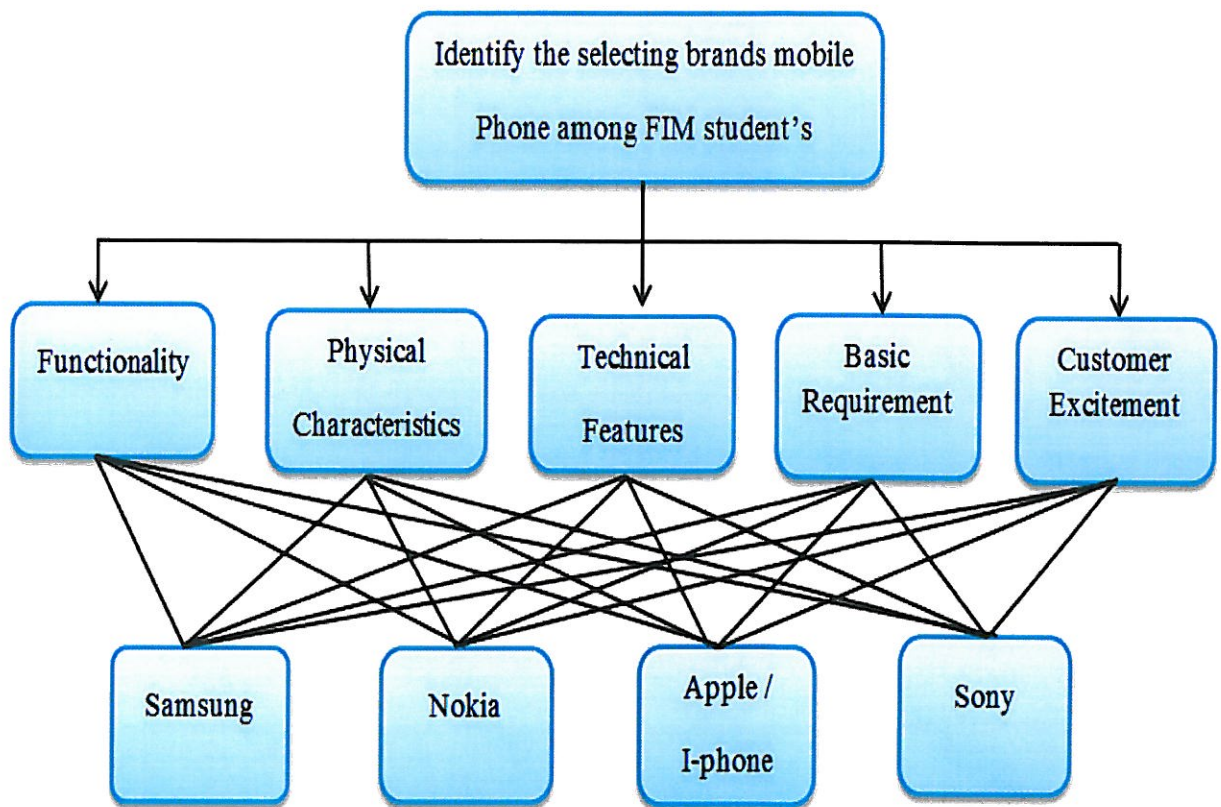


FIGURE 1.1: The hierarchical framework structure

1.5 SIGNIFICANT OF STUDY

- The findings of this research will be useful and important for others to doing the similar of research in academic field in future.
- This finding of this research can become great information for those companies who has been involved in research of branding process in order to identify perception of the consumers for their branded product.
- This finding also will broad enough to generate interest among a sufficiently large group of researchers because it analysis of load of facts about the various criteria of choice that determine the perceptions and preferences of brand mobile.

1.6 SCOPE OF STUDY

The scope of this research is to focusing on the student preference in manufacturing design using the method of Analytical Hierarchy Process (AHP). This research also focused on a part of student preference and perfection on selection of brands mobile phone. This study has conducted at Universiti Malaysia Pahang (UMP) in Gambang.

Other than that, the required data has collected among degree students in Faculty of Industrial Management (FIM) at Universiti Malaysia Pahang (UMP) regardless men or women. Besides that, the respondent also not focus just to a few semester but it include all of semester, which is first year to fourth year student in Faculty of Industrial Management at UMP campus Gambang. Meanwhile, the data will be collected based on questionnaire.

1.7 METHOD OF STUDY

The method that use in this study is Analytical Hierarchy Process (AHP). This research uses the AHP as a method to analyze the data because this method is one of the strongest and the best scoring decision making process to helping to help FIM student to make the best decision to selection of brands mobile phone.

Besides that, the AHP has been widely used to solve multi-criteria decision making in both of academic research and also in industrial practice. Analytical Hierarchy Process (AHP) also associated with evaluate and also to selecting different criteria and alternatives in perfection of brands mobile phone among FIM student.

In addition, AHP has been implemented in almost all applications related to decision-making and is currently predominantly used in the theme of selection and evaluation especially in the area of engineering, personal and social categories.

1.8 OPERATIONAL DEFINITIONS

The Analytical hierarchy process principles as a whole is AHP consists of three main principles, including hierarchy framework, priority analysis and consistency verification. The first step of AHP is formulating the decision problem in the form of the hierarchy framework, with the top level representing overall objectives or goal. For the next step is the middle level constituted the criteria and sub-criteria, and then finally the decision alternatives of AHP are at the lowest level.

The AHP technique can performs pairwise comparisons to measure the relative importance of elements at each stage or level of the hierarchy and evaluates alternatives at the lowest stage of the hierarchy in order to make the best decision among various alternatives. Besides that, the AHP allocates decision makers with a way to change the subjective the full text archive of this journal can be obtained to judgments into objective measures.

Other than that, In the AHP the decision making process starts with dividing the problem into a hierarchy of issues which should be considered in the work. These hierarchical orders help to simplify the illustration of the problem and bring it to a condition which is more easily understood. Therefore, in each hierarchical level the weights of the elements are calculated. The decision on the final goal is made considering the weights of criteria and alternatives.

For the last but not least, in this research study has provided with four brand of mobile phone. First is the Samsung brand, is the Korean company that was found at 1938. Now for the second brand is Nokia, that was founded in 1965 at Finland by Fredrik Idestam. For the third is the Apple or I-phone brand, that was founded by Steve Jobs in 1976 at California. Lastly, for the fourth of brand mobile phone is Sony, is a Japanese company that was founded in 1946 by Masaru Ibuka.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

For this chapter, the previous relevant literatures were reviewed. It provided several definitions for mobile phones, branding and also Analytic Hierarchy Process (AHP). It also gave insights in the different dimensions about the factors affecting consumer choice of mobile phone. Other than that, the overall description of the Analytic Hierarchy Process (AHP) and the AHP method used in manufacturing also discussed in details in this chapter.

2.1 DEFINITION OF THE MOBILE PHONE

The Mobile phone is one of the electronic communication equipment. Besides that, it is also known as a telephone. Each phone generally is connected by a radio link to the base station. Radio wave or also commonly known as satellite transmission are extremely medium through which mobile phone to get connected to a wireless network. In addition, cellular telephone systems this is linked to the telephone network, which is one of the largest machine or technology on nowadays.

According to Coghill (2001), clarify that the mobile phone is considered as “the most radiative domestic appliance ever invented”. That means the mobile phone is one of the among contemporary mobile communication technologies currently.

Besides that, according to Comer and Wikle (2008) indicate that in the modern history of the world at present, this device also is the fastest rates of household consumption in any technology.

For last but not least, according to Rice and Katz (2003), further explained that the growth has been phenomenal that are available worldwide is more mobile phone portable than fixed line subscribers currently. However, according by Walsh and White (2006) clarifies that the mobile phones are no longer seen to be luxury items or status symbol but has become one of the necessities in daily life following the increase in the widespread ownership of mobile phones.

2.1.1 Factors that effecting consumer of mobile phones

According to Heikki, Jeri et al (2005) in the research on factors that affecting consumer preference of mobile phones, from research at Finland it involves the two studies shows the strong evidence that although mobile phones are developing at a higher pace closer with personal digital assistants (PDAs), however, there are many consumers tend to be unaware of the properties and services the new models and brands of mobile phones in the market contain. Besides that, in this research also show that they have seven factors which play a big role to characterize mobile phone choice. For example, there are pricing, brand and basic properties, outside influence, reliability, innovative services, multimedia and design.

In addition, according study by Liu (2002) at the Philippines shows that selection between mobile phone brands were affected by new technology features such as SMS-options and memory capacity, more than size.

Besides that, this finding research might due to the fact that all competing brands have quite similar size phones that are small enough. Therefore, the researcher recommends that the trend actually be not towards smaller size but towards phones that has ability and larger screen in fact.

From Ling et al. (2006) reviews that users' preference levels with five mobile phone design features namely, camera, color screen, voice-activated dialing, Internet browsing, and wireless connectivity. Finally, the results in this research showed that color screen, voice-activated dialing, and Internet browsing feature predict consumer satisfaction levels.

In addition, in their second study (Ling, Hwang and Salvendy, 2007), to identify the selection between the design features and overall satisfaction college student of cell phones while and this studies are covering a sample of 1,006 college students. So at the end of the results, this study found that the level of user satisfaction is most influenced by the physical characteristic, size and menu application of the mobile phone.

2.2 CONCEPT OF BRANDING

Branding is one of the strategies that are used by marketers in the business. According to Pickton and Broderick (2001) describe that the branding as Strategy to differentiate of products and companies, and also to build economic value for both the consumer and the brand owner. Besides that, brand occupies space in the perception of the consumer at this time, and is what results from the whole of what the consumer takes into consideration before making a purchase decision of the product.

So, branding is a strategy and, brand is what has lead meaning to the consumer. Furthermore, there are also has some other terms used in branding such as brand Equity is the addition of the brand's attributes including reputation, symbols, associations and names. Then the financial expression of the elements of brand equity is called Brand Value.

According to Mei-jian, Haibo & Qiong, (2012) it that was show the brand emotion of the web consumers, group effect, enterprises networking marketing methods, perceived brand identity are the four factors that affecting the choice behavior of web consumer in a different stage and way.

Besides that, the first two factors will affect choice behavior through the consumer preference. Whereas of the second two factors affect brand choice behavior indirectly through preference.

In addition, by empirical study, they have concluded that the promotion have neither significantly positive effects not even significant negative ones. Response to brand identity does not directly produce effect on the choice behavior through the preference, but that give an affects it through the brand emotion of web consumers.

For the last but not least, according Zhou.N & Shanturkovska G,(2011) on their research on Chinese Consumer Behavior in the Mobile Phone market – Nokia Case explained that the successful strategies of Nokia to become a brand mobile are working with the locals, maintaining customer satisfaction, offering diverse product portfolio, establishing strong brand image, prioritizing —people first, localizing research and development centers, expanding broad distribution channels, and also implementing low pricing.

2.3 DESCRIPTION ANALYTIC HIERARCHY PROCESS (AHP) METHOD

The Analytic Hierarchy Process (AHP), developed by Saaty (1980) and has been extensively studied and almost used in across of the applications associated with multiple criteria decision making (MCDM). In several books and articles have been according to (Vargas, 1990; Saaty, 1990, 2001b; Saaty and Vargas, 2001), have been tells and describes about the theoretical background and mathematical concept of the Analytic Hierarchy Process (AHP) methodology. Besides that, according to Steuer and Na (2003) has revealed that have approximately 18 articles review the AHP that combined with finance simply, whereas according to Vaidya and Kumar (2006) has found that approximately 150 articles investigating the AHP that combined with general applications.

In addition, The AHP methodology has compares criteria, or alternatives with respect to a criterion, in a natural, pairwise mode. To doing so, the AHP has uses a fundamental scale of absolute numbers which have been proven in practice and confirmed by physical and decision problem experiments. Besides that, the fundamental scale has been proven to be a scale that can attract individual preferences with respect to quantitative and qualitative attributes just as well or better than other scales according to Saaty (1980, 1994).

In accordance with Muralidharan et al. (2002) that proposed a five-step AHP-based model to help decision makers in the evaluation and selecting suppliers associated with to nine evaluating criteria. Other than that, People from the different functions of the company, such as purchasing, stores, and quality control, are involved in the selection process.

Whereas according to Chan (2003) formulated an interactive selection model with AHP to facilitate decision makers in selection suppliers. The model is called like this because it incorporated a method called chain of interaction, which has been used to ensure that the relative importance of evaluating criteria without subjective human judgment.

2.3.1 Analytic Hierarchy Process (AHP) in manufacturing

The Analytic Hierarchy Process (AHP) in manufacturing according to Ertay et al. (2006) is that integrated AHP for facility layout design in manufacturing systems. In their study, that criteria has been reduced are known as inputs, and whereas the criteria to be maximized were considered as an outputs. After that, AHP also can used to collect qualitative data related to the quality and flexibility.

In another study on supplier selection, that has been done by Chan et al. (2005). In their study that developed a hybrid genetic algorithm for distribution problems and production in several of factory supply chain models.

Other than that, in their work, the AHP method found to be used to fix weights and associated with supply chain criteria such as operating cost, service level, resources utilization and so on.

Other than that, according to Carnero (2005) that propose one of the models can conduct of the decision making associated with selection of diagnostic techniques and instrumentation in predictive maintenance programs. Besides that, this model that was combines AHP and factor analysis and has been tested in screw compressors with integration of lubricant and also vibration analyses.

Whereas, according to Lam and Chin (2005) have reviewed the critical success factors of conflict management in cooperation of the new product development. By using AHP method, they has emphasize the importance of four categories of success factors, such as relationship management, conflict handling system, new product development, process management, and also communication. For the final result, they found that communication management, trust, and commitment to the cooperation are the most important factors.

2.4 SUMMARY

This chapter explained about some concept or definitions for mobile phone, branding and also Analytic Hierarchy Process (AHP). Other than that, in this chapter also explained about factors and criteria that affecting the consumer preference to choose of mobile phones, the several term of branding, and usefulness of the Analytic Hierarchy Process (AHP) in manufacturing.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 INTRODUCTION

By a simple explanation, research methodology can be described as a one of process used to collect the data and other types of information for use in making decisions. Other than that, the word of “Methodology” its shows more than simply the methods we want to use to collecting the data. Besides that, when the methods has been used should be described in sufficient detail for the study to be replicated, or at least repeated in a similar way in another situation.

Therefore, this chapter show about the methods was been used for this research such as questionnaire and analyzing data. This involves the description of the population and the sample size, the instruments used for the collection of data and the administration of the instrument of the study.

3.1 RESEARCH DESIGN

3.1.1 Data types

In this study, i will use both of data types which are primary and secondary data has been chosen to collect the data that used in analyzing the research study. Based on the research topic, I think it is most suitable to employ both primary and also secondary data collection method.

Besides that, the Primary data were obtained through questionnaires given to respondents while the secondary data were gathered through journals, articles, internet and other published materials.

3.1.2 Primary Data collection

The primary data in this research was gathered through the questionnaires. The Questionnaire surveys one of the most popular data collection methods in the research. In this study, the structured questionnaires will be given or distributed among Faculty of Industrial Management (FIM) students in Universiti Malaysia Pahang (UMP) at campus Gambang.

3.1.3 Secondary Data collection

Secondary data means data that are already available which is refers to the data which have already been collected and analyzed by someone else. In this research, Secondary data consist of data retrieved from University database, such as articles, journals, literatures in addition to books borrowed from University library or retrieve from Google Books and Google Scholar.

Besides that, with the availability of this materials would facilitate this research study. According to the vast gathered data, lots of definitions and conceptions are illustrated in the chapter two.

3.1.4 Measures (instrument development)

In this study, it will use a quantitative approach to identify what brands become preferred among Faculty of Industrial Management (FIM) students. Questionnaire will be used as an instrument in this study. The questionnaire will be conduct in English language. In addition, the question has been chosen for the questionnaire would be close ended.

This is because, Close ended question will help the respondent to make quick decision and help researcher to code the information easily for subsequent analysis. This questionnaire will be comprised of forty-four questions survey to ask for the respondent includes the socio demographic survey.

The questionnaire in this research will consist of 2 parts which is Part A and Part B. Part A will includes four socio demographic questions including; gender, age, race, and also the years of study among the FIM students. Besides that, in part B consists of forty questions. The questions in part B of inquired about the criteria and also the alternative of brand mobile phone. In this part B beginning from questions number 5 to 44; these statements will be graded using a 9-point Likert Scale. These points in the scale are range from the pairwise comparison.

3.2 DATA COLLECTION METHOD

3.2.1 Population and sampling

In this data collection method, the sample of this study includes one hundred and sixty-nine of degree students in Faculty of Industrial Management (FIM) that has been selected based on Morgan table (1970) research on determining on the number of sample size.

It is on the sample size from the population proportion of the location which is three hundred students from the overall of degree students Faculty of Industrial Management (FIM). In addition, The FIM students will be selected randomly in all semester of their study

3.3 DATA ANALYSIS TECHNIQUES

Based on the above discussion, this study uses AHP method to identify the most preferred brands mobile phones, the most important factors influencing the selection of brands mobile phones based on students' preferences and identify the most popular ranking of brands mobile phone among Faculty of Industrial Management (FIM) students.

Besides that, AHP method is one of the strong decision making process to determine the priority between the different criteria. Therefore, AHP includes five steps to summary as follows:

I. Step 1 :

In the step 1, AHP method uses several smaller sub problems to present a complex decision problem. Therefore, the first act is we have to decompose the decision problem into the hierarchical structure of the decision making problem (hierarchy tree). In this hierarchy structure, we have to identify the goal at the top, criteria at the second level and decision alternatives at the bottom of the hierarchical structure of the decision making problem that show in Figure 3.1:

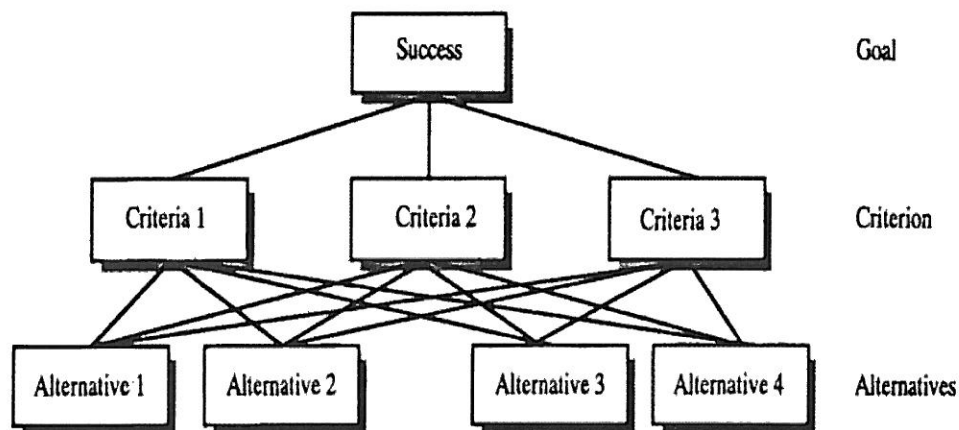


FIGURE 3.1: The hierarchical decision making problem

II. Step 2:

In the second step we have the decision matrix. The decision matrix is based on Saaty's nine-point scales are constructed. Therefore, the decision maker uses the fundamental 1–9 scale defined by Saaty to assess the priority score.